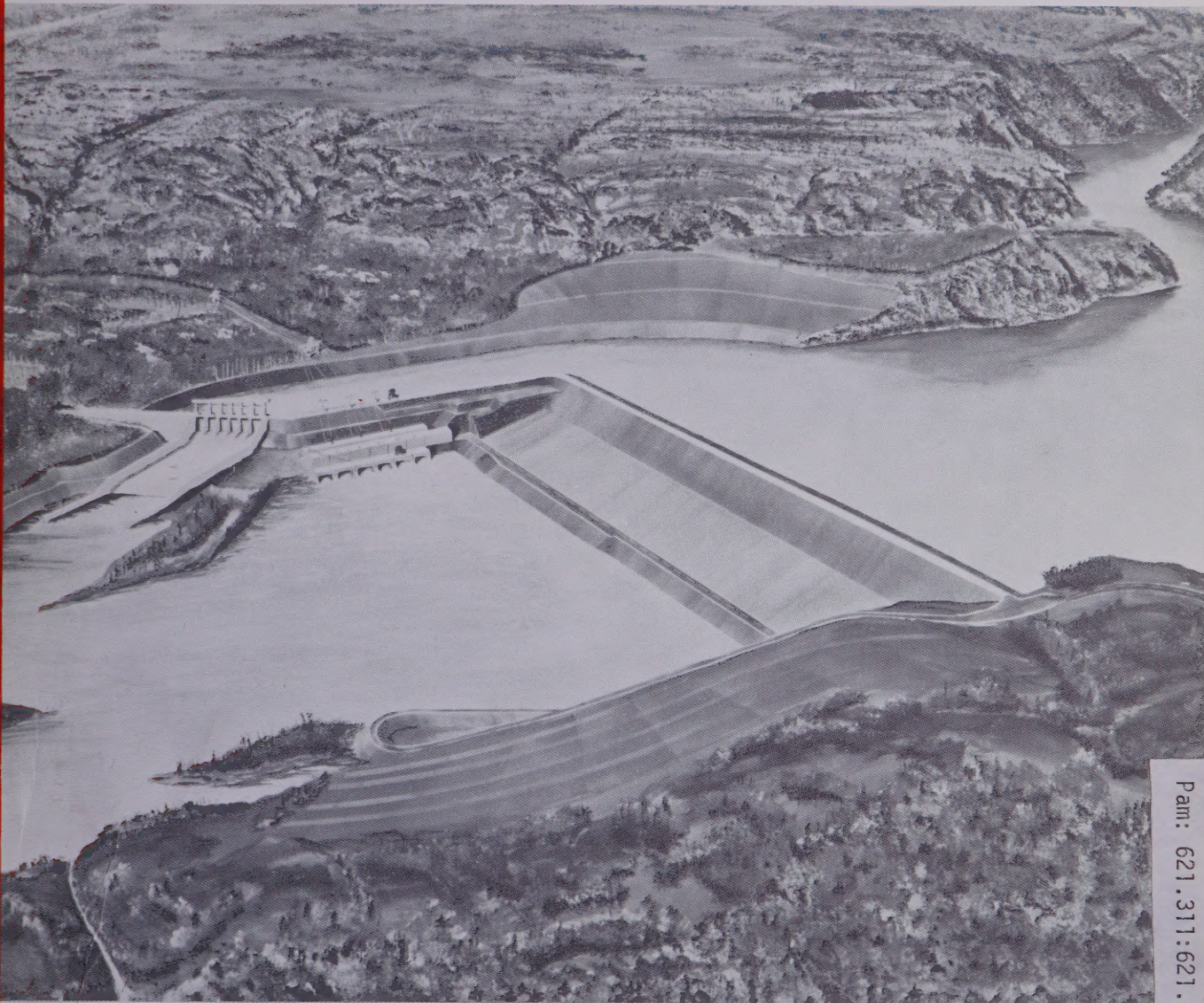


HIGHLIGHTS

of the proposed
Peace River Site C Project



B.C. HYDRO

October 1980

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Dotted line indicates approximate centre line of the proposed Site C dam on the Peace River, just downstream of the Moberly River near Fort St. John. This view is looking north.

HIGHLIGHTS of the proposed Peace River Site C Project

Introduction

This report provides information on the proposed Site C hydroelectric project on the Peace River near Fort St. John. The project's effects on the social and physical environments are discussed.

B.C. Hydro engineering and environmental studies of hydroelectric development on the lower part of the Peace River have concentrated on Site C since 1976.

The project at Site C was chosen because it is more economic and would have less environmental impact than other arrangements examined in earlier studies of this portion of the Peace River.

Thurber Consultants Ltd., of Victoria, headed a team of environmental consultants who have studied the effects of the project on the environment and the community and have made recommendations on how to deal with those effects. Results of the studies are compiled in some 14 reports.

Readers who would like more detailed information are invited to view B.C. Hydro's complete Environmental Impact Statement and background studies at local libraries in British Columbia, at the B.C. Hydro Head Office in Vancouver or at the Site C Information Centre, 9916 100th Avenue, Fort St. John.

Inquiries should be directed to B.C. Hydro, Community Relations Department, 970 Burrard Street, Vancouver, B.C., V6Z 1Y3.

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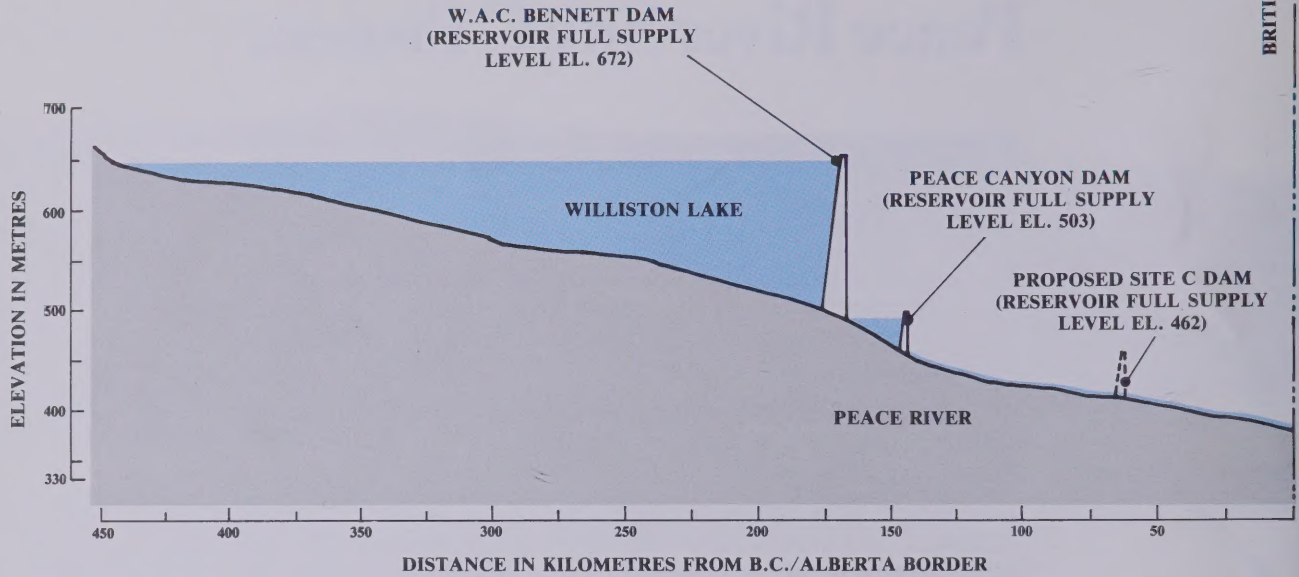
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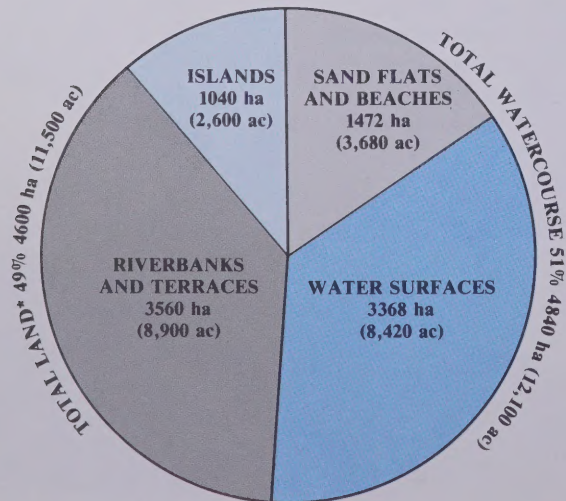
Reservoirs Profile

BRITISH COLUMBIA
ALBERTA



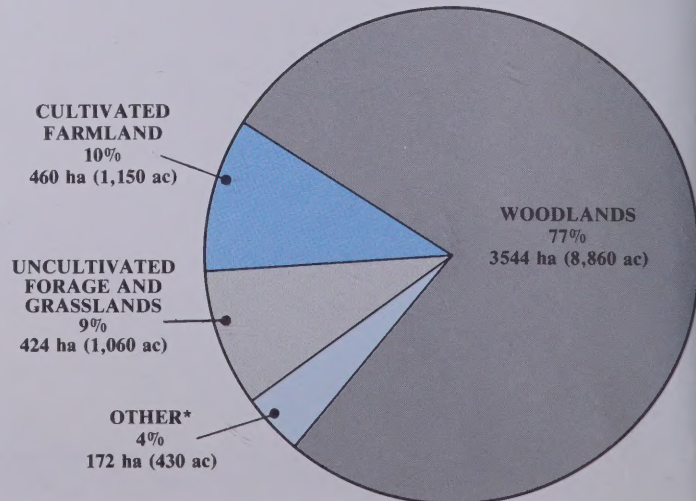
Land and water areas within proposed reservoir

TOTAL AREA 9440 ha (23,600 acres)



*DOES NOT INCLUDE 480 ha (1,200 ac)
REQUIRED FOR CONSTRUCTION
(SOME ONLY TEMPORARILY)

LAND AREAS THAT WOULD BE FLOODED



*INCLUDES:
UNPRODUCTIVE ROCKS, BANKS
AND BOG 80 ha (200 ac)
DEVELOPED FARMLAND AND
RESIDENTIAL SITES 60 ac (150 ac)
RECREATION RESERVES (MOSTLY
WOODLANDS) 32 ha (80 ac)

Project description

B.C. Hydro's proposed Site C hydroelectric project would be located about seven kilometres from Fort St. John on the Peace River in north-eastern British Columbia.

Development of the Peace River for hydroelectric power began some 20 years ago with the W.A.C. Bennett Dam, about 177 km upstream of the B.C.-Alberta border. The dam's reservoir, Williston Lake, controls the flow of the Peace River. Its G.M. Shrum Generating Station has a maximum continuous generating capacity of 2730 megawatts (MW), and last year produced about 39 per cent of the electrical energy for B.C. Hydro's integrated system.

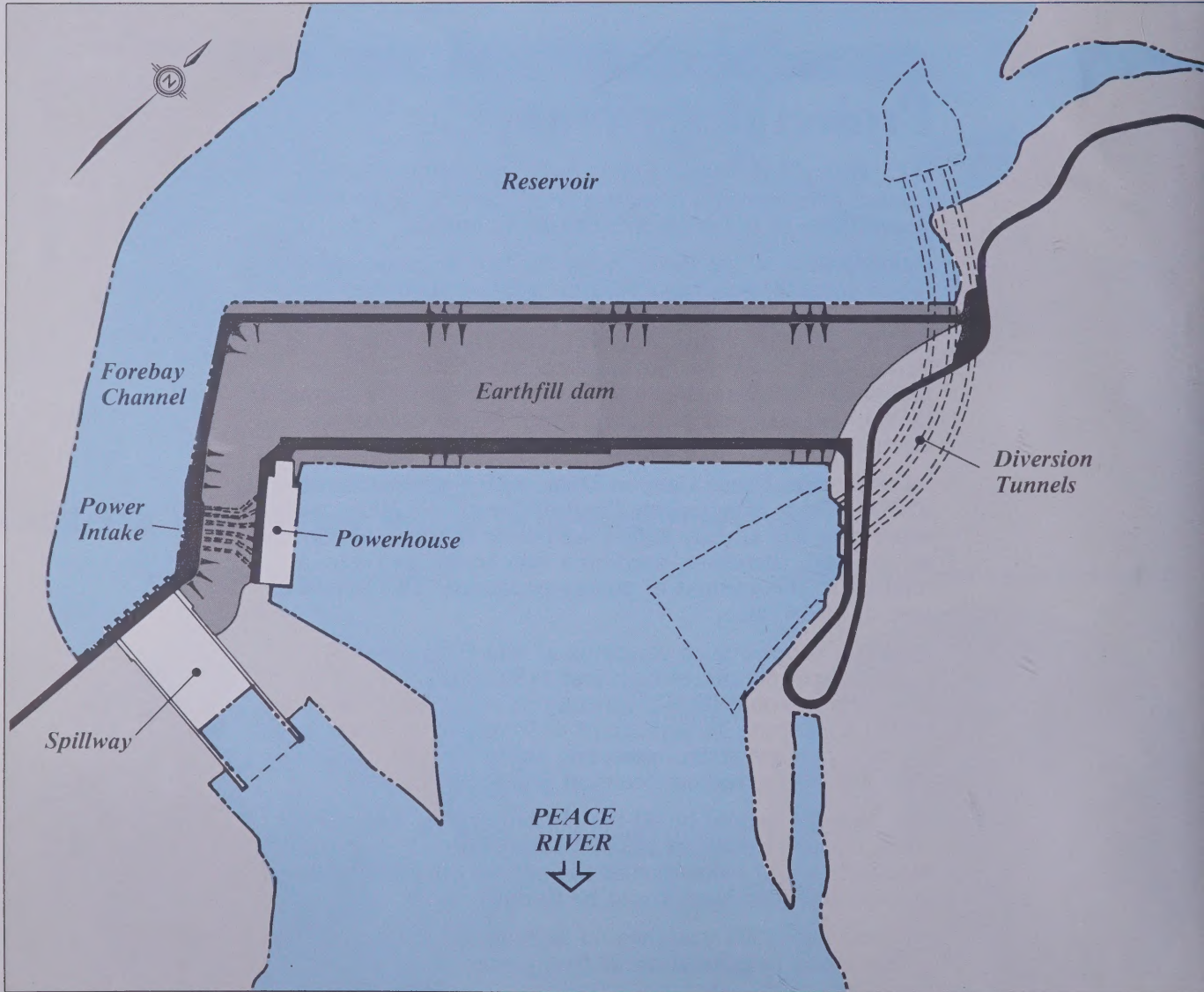
Downstream, Peace Canyon Dam, with a generating capacity of 700 MW is essentially a "run-of-the-river" plant, using water that has already generated power at the G.M. Shrum station and, therefore, needing a very small reservoir in relation to the amount of energy produced. This would be true of Site C also.

Hydro is proposing to construct at Site C an earthfill embankment 60 metres high and 1180 metres long. The powerplant would have a capacity of about 900 MW and would contribute an average of 4530 million kilowatt-hours of energy to the system per year, about nine per cent of B.C. Hydro's expected electrical generation in 1987.

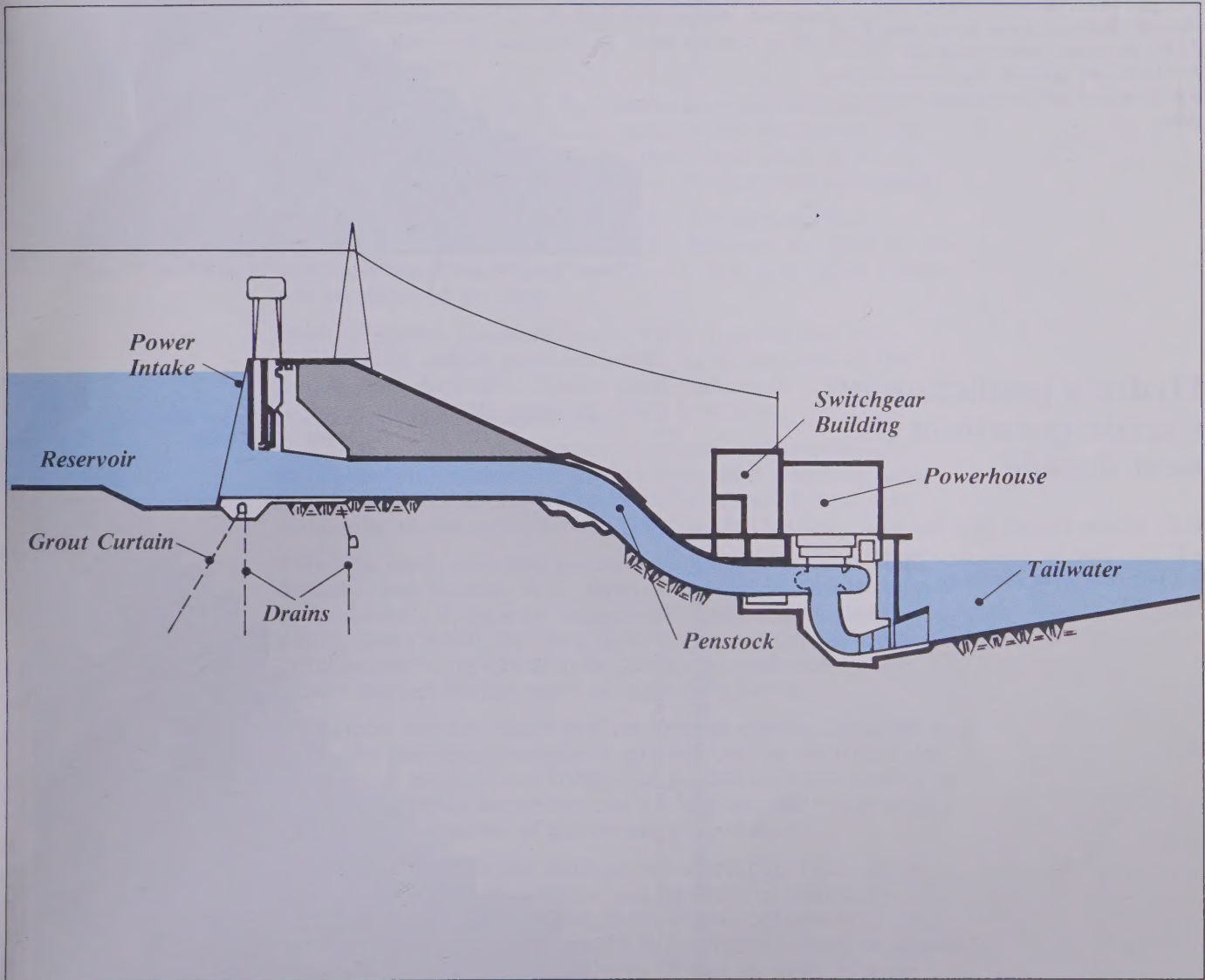
The reservoir would be 80 km (50 miles) long and have a surface area of 9440 ha (23,600 acres). The average width would be about twice that of the present river and 4600 ha (11,500 acres) of land would be flooded.

Approximately six years would be required from start of construction to generation of first power.

Proposed Peace River Site C Project

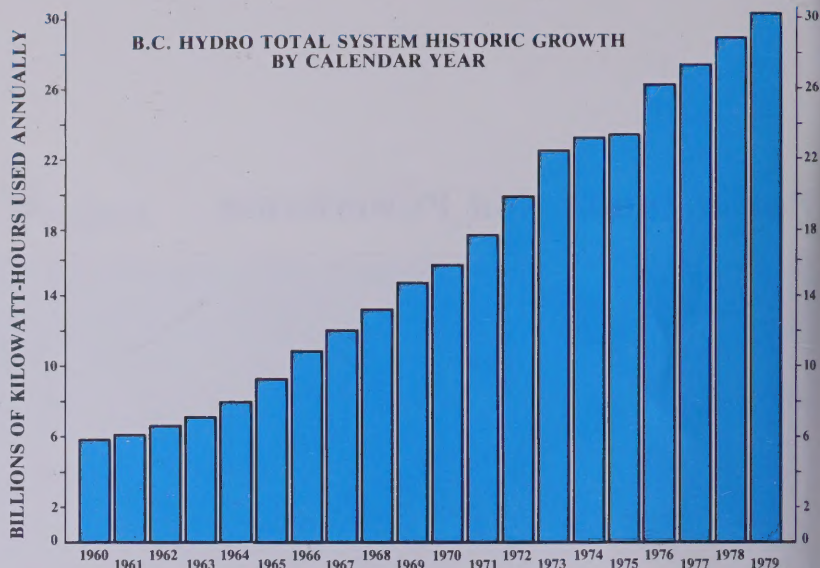


Power Intake and Powerhouse



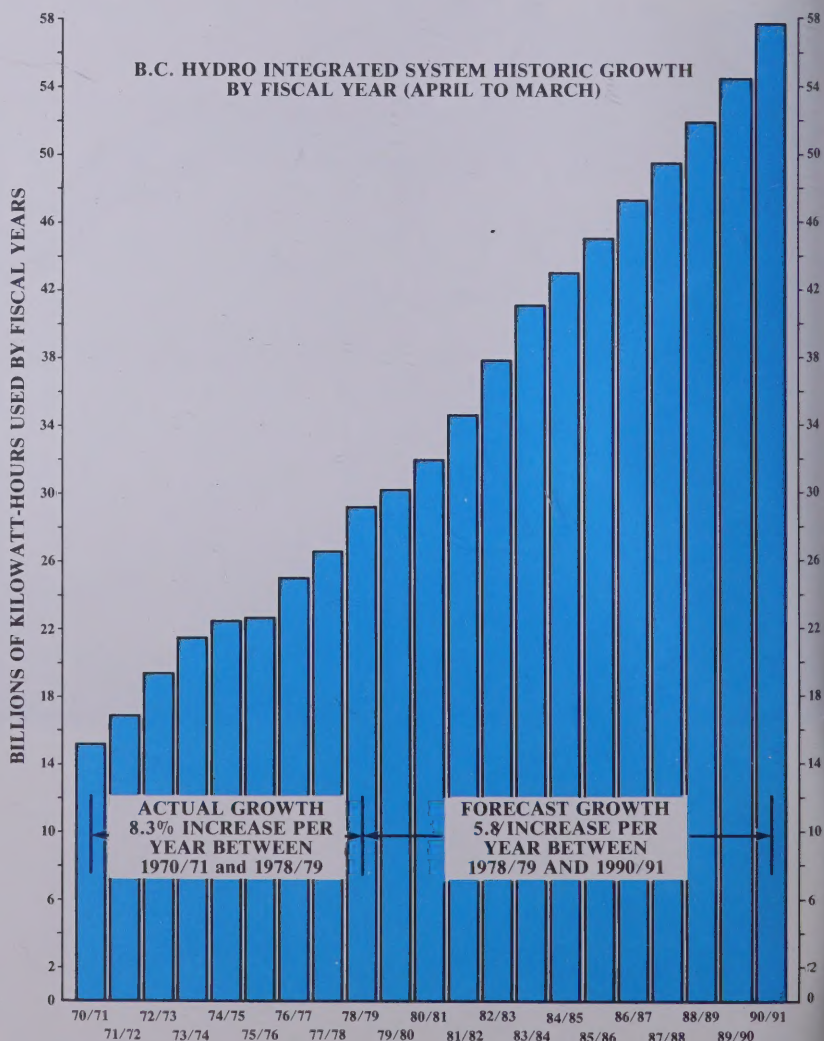
Total B.C. Hydro annual electric load growth by calendar year

Over the last 20 years, the total electric load increase has averaged 9% per year. In some years the electric demand grew by as much as 12%. In other years (such as 1973-75) the growth was much lower, but demand still increased every year.



Hydro's prediction of electric growth in the next decade

B.C. Hydro expects that the load will continue to grow, averaging 5.8 per cent over the next 10 years.



The need for Site C

At the moment, electricity accounts for some 17 per cent of energy consumption in British Columbia. Demand for electricity has been increasing, as is shown in the graph at the top of page 8.

Every year, B.C. Hydro forecasters estimate electricity demand for the next 20 years, using many indicators and sources of information. It is on these constantly updated forecasts that plans for new power developments are based.

B.C. Hydro currently estimates that the demand for electricity will increase by about 5.8 per cent per year in the 1980's. With this growing demand, a new generating facility will be required by 1986.

Most of British Columbia's electricity is generated by B.C. Hydro, which provides power to 92 per cent of the population. And B.C. Hydro must make sure it has the facilities to meet the demand when it occurs.

For each potential hydroelectric project, engineering and environmental studies are undertaken, with planning done first for those that appear to be most economic and least disturbing to the environment and the community.

Planning must take into account not only normal growing demand, but because B.C. Hydro's system is almost entirely hydroelectric, it must be designed to meet that demand during years when the river flows are lower than average. Surplus electricity can also be generated and sold on the export market during years of high river flows.

If projects are not ready in time to meet electric demands in B.C., the province's economic growth can be restricted. In contrast, if projects are completed before they are needed in B.C., the surplus electricity can be sold outside the province within the guidelines of government regulations.

If low water conditions exist in years prior to 1986, more expensive thermal generation and imports of electricity, if they are available, will have to cover any deficits until the next project is ready. Although B.C. Hydro's forecast shows a need for a new facility to be in service in 1986, it is no longer possible to meet this date.

Site C can be built soonest of all B.C. Hydro's potential projects. It is economic, and could be in service by October 1987. We are also confident that, if appropriate mitigation and compensation measures are taken, Site C can be made acceptable to the people of British Columbia.

Firm electric energy capability of existing and committed projects compared to forecast electricity requirements

B.C. Hydro, like other electric utilities, is expected to meet its customers' requirements for electricity at all times.

The pie charts opposite show that the electric system in B.C., unlike most other places in North America, is mostly hydroelectric. This means that almost all the electricity in B.C. is generated in hydraulic turbines by falling water. The main disadvantage of such

hydroelectric based systems is that the water supply is not consistent because it depends on the amount of snow and rain fall each year.

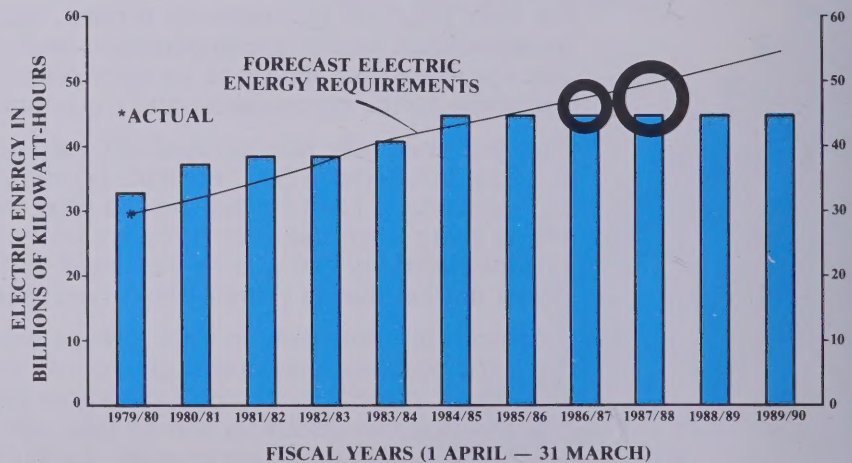
In some years, because of below normal snow and rain fall the run-off will not fill the reservoirs. As a result there will not be enough water to produce the full amount of electricity that the powerhouses are capable of generating under "good" water conditions.

Since "low" water years (such as in the early 1940's) may reoccur, the B.C. Hydro electric system is designed to meet our customers' requirements even in a dry year.

The total electric energy generated at each of the hydroelectric projects during "low" water years plus the output of the Burrard Thermal plant is termed the "firm energy capability" of the B.C. Hydro electric system.

By 1986/87 total electric energy requirements of B.C. Hydro customers are expected to exceed firm electric energy supply by more than 2.5 billion kilowatt-hours. That shortfall is about equal to the electricity needed in one year by cities the size of Victoria and Nanaimo combined. Hydro plans to cover this energy deficit by purchasing electric energy from Alberta utilities or private sources.

By 1987/88 total electric energy requirements are expected to be about 4.8 billion kilowatt-hours higher than firm electric energy supply. That shortfall is about equal to the average amount of electricity used by the entire B.C. Hydro electric system in two months of 1980. Peace Site C and an electric energy purchase in 1987/88 would be required to cover this energy deficit.

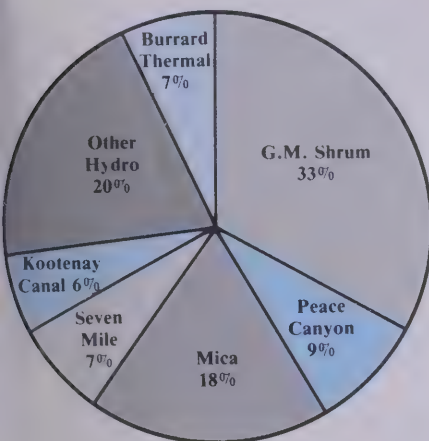


The blue bars show the total firm electric energy capability of all existing and committed B.C. Hydro projects. The energy capability will increase from 1979/80 to 1984/85 as

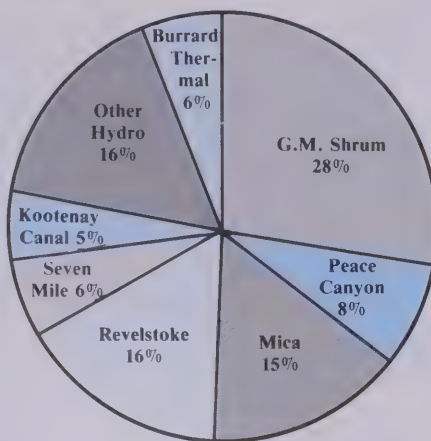
the Seven Mile, Peace Canyon and Revelstoke projects come into service. In 1984/85 the total firm energy capability will be about 44.7 billion kilowatt-hours.

What share of the total firm energy capability does each project generate?

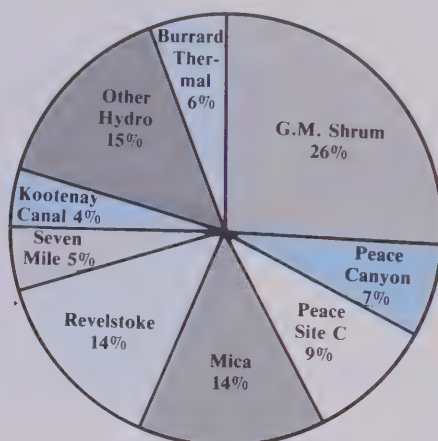
AT THE END OF 1980 THE TOTAL FIRM ENERGY CAPABILITY WILL BE ABOUT 37.6 BILLION KILOWATT-HOURS.



AT THE END OF 1984 THE TOTAL FIRM ENERGY CAPABILITY, INCLUDING REVELSTOKE, WILL BE ABOUT 44.7 BILLION KILOWATT-HOURS.



WITH THE ADDITION OF PEACE SITE C THE TOTAL FIRM ENERGY CAPABILITY WOULD BE ABOUT 49.2 BILLION KILOWATT-HOURS.



Cost and financing

The estimated cost of developing Site C and connecting it to the B.C. Hydro electrical grid is about \$1.9 billion. This includes allowances for corporate overhead, interest during construction, and inflation.

Money for the dam will be raised both from revenues and from loans (debt financing). The loans are much like mortgages on a home in that the debt is backed by an asset which, in B.C. Hydro's case, is owned by the people of British Columbia.

Since the dam will produce power for decades to come, it makes sense to spread the cost over the life of the project with today's customers paying rates which include the interest cost on the loan.

Two major U.S. financial rating services, Standard and Poor's of New York and Moody's Investors' Service, have given B.C. Hydro a triple A rating, the highest available. In 1980, Hydro had a debt of about \$5.4 billion, backed by revenue-producing assets of about \$6 billion, based on original cost. If today's replacement cost for these assets were considered, the value would be very much larger.

Site C will not alter this picture. The proportion of revenue allocated for paying debt charges will not change when the project is added to the system.

Agricultural Impacts

Land affected as proportion of provincial agricultural land

SUITABLE FOR INTENSIVE CULTIVATION
(GRAINS, VEGETABLES)
.5% OF PROVINCIAL TOTAL

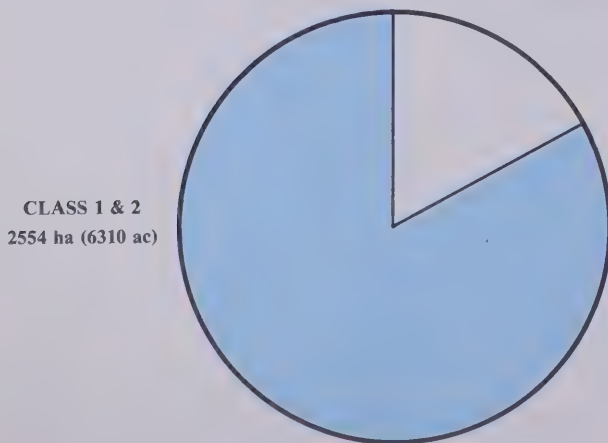


SUITABLE FOR CULTIVATION
0.1% OF PROVINCIAL TOTAL

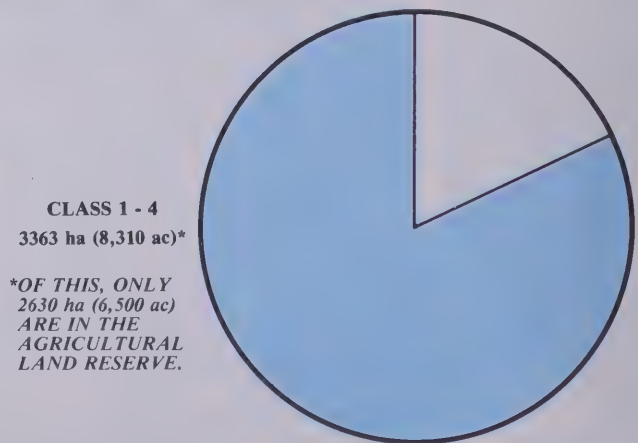


Land affected as proportion of Peace River Valley agricultural land

SUITABLE FOR INTENSIVE CULTIVATION
(GRAINS, VEGETABLES)
17% OF PEACE RIVER VALLEY



SUITABLE FOR CULTIVATION
18% OF PEACE RIVER VALLEY



General Description of Capability Classes

- Class 1** Land is capable of producing the very widest range of vegetables, cereal grains, forages, berry fruits and numerous speciality crops. Soil and climate combinations are optimum.
- Class 2** Land is capable of producing a wide range of regional crops as above with some differences in variety due to minor restrictions of soils or climate.
- Class 3** Land is capable of producing a fairly wide range of regional crops under good management practices. Soil and/or climate limitations are somewhat restrictive.
- Class 4** Land is capable of a restricted range of regional crops such as hardy cereal grains, hardy vegetables and forages. Soil and climate limitations demand special management considerations.

Effects of the project

B.C. Hydro has recently released its Environmental Impact Statement on the Site C project. This document analyzes British Columbia's need for the project, summarizes information from the environmental studies conducted over the past three years and includes Hydro's environmental guidelines and policies on compensation and mitigation.

AGRICULTURE

A key concern about the project is the effect it would have on agriculture in the lower Peace River Valley.

Briefly, the Site C project would take 2600 ha (6,500 acres) from the 21 200 ha (52,500 acres) in the Agricultural Land Reserve in the lower Peace River Valley. That means 18 600 ha (46,000 acres) would remain unaffected in the ALR if the project were to move ahead. It would flood only 444 ha (1,100 acres) currently under cultivation.

In total, the project would flood 4600 ha (11,500 acres) of land and about 4850 ha (12,000 acres) of watercourse including river bed and sand bars. (See chart on page 4.)

Site C would not preclude the development of a fresh vegetable market or a vegetable processing industry since more than twice the amount of agricultural land in the valley needed to support such industries would remain unaffected.

However, studies show that it is unlikely that a vegetable processing industry would develop in the Peace River with or without Site C because of the relatively small market area that it would serve on a competitive basis and because it appears to be more economic to import vegetables from the Lower Mainland than to grow them or process them locally.

RESIDENTS

Another concern, particularly of those who live in the valley, is the number of people who would have to move because of the project. Hydro's latest information indicates that 35 households or about 135 persons would have to relocate if Site C were developed.

TOURISM AND RECREATION

The project could lead to an increase in tourism in the Site C area over the long term if tourist facilities were provided near the reservoir. But the character of recreational activities would change from river-oriented past-times to lake-oriented boating and fishing. The scenic qualities of the islands and river shoreline would be changed to less interesting lake scenery.

**At Attachie Flats
looking south**



**Near Farrell Creek
looking east**



. .with Site C





JOBS AND MONEY FOR LOCAL PEOPLE

Consultants' studies initiated by Hydro indicate that about 1000 jobs, both directly and indirectly related to the project, would be created during construction for local residents and about \$110 million would be injected into the local economy. Projected construction peak force would be about 2000. A percentage of these workers would bring their families and this would place a temporary demand on school and municipal services.

FORESTRY

The effect of the project on forestry would be small since less than one fifth of the reservoir area has marketable timber, much of which is in small patches and difficult to harvest.

FISH AND WILDLIFE

Studies indicate that there would be losses of wildlife in the area such as moose and deer due to reduction of habitat. Some species of fish would increase in abundance and others would decrease if the project were constructed, but a sports fishery could be developed on the reservoir with appropriate management.

PHYSICAL ENVIRONMENT

A residential safeline has been established around the reservoir. All natural or reservoir induced erosion would be well within this safeline setback. In low bank areas, bank sliding and beach erosion could affect up to 162 ha (400 acres) and in high bank areas, the amount of unstable land would be comparable.

The climatic changes which can be expected to occur, will be, for the most part, small in magnitude and confined to an area very close to the reservoir shoreline.

Greater frequency and density of fog is expected on terraces adjacent to the reservoir and a small decrease in night temperature by comparison to the present microclimate.

HERITAGE SITES

Only one major historic site, the Rocky Mountain Fort, would be flooded. Rocky Mountain Portage House, located near the shoreline of the proposed reservoir, might also be affected by the reservoir.

Some other areas where artifacts have been found may be affected to varying degrees by the reservoir or by construction activity.

Measures to deal with effects of the project

B.C. Hydro has been working with the Provincial Government, local Governments and interest groups to establish ways and means of compensating for project impacts.

The first step in this process was the identification of the impacts through study. The second step was the development of principles on which proposed compensation measures could be based. Both the effects and the principles are detailed in the Environmental Impact Statement.

The following list gives some idea of the scope of compensation projects which Hydro is discussing with the interested parties. Hydro is committed to providing this compensation as part of the cost of constructing a project such as Site C.

- Picnic areas, boat launching facilities and campgrounds as compensation for general recreation impacts.
- Some combination of stocking, spawning, or incubation facilities to mitigate any fishery losses and promote a sport fishery.
- Payment for wildlife management programs as compensation for lost habitat.
- Payments to trappers for any trapline losses.
- Development of environmental guidelines to be followed by its construction contractors.
- Compensation for socio-economic impacts which can be directly related to the project.

Conclusion

There is no doubt that projects like Site C have effects on the environment. There is also no doubt that the power demanded by the consumers of British Columbia has to be provided economically. Somehow a balance has to be found between the electric power that is required and the environmental impact that is created.

In B.C. Hydro's opinion, Site C meets the criteria better than any other option now available to the Province. The final decision of course, will be up to the Government and people served by B.C. Hydro.

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